# Luminescent Torch

027

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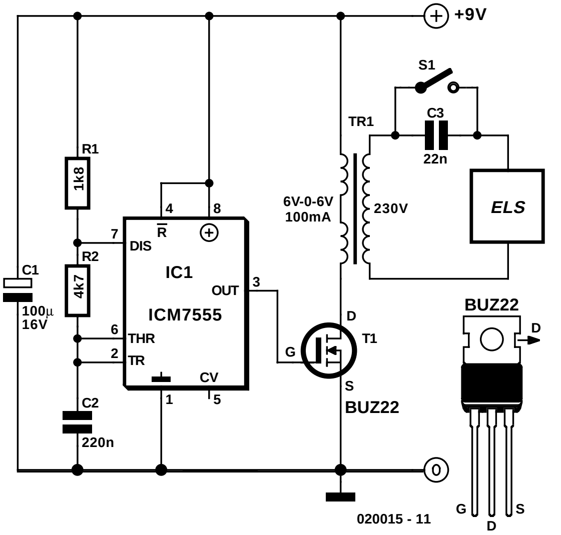
An electro-luminescent sheet (ELS) is capable of emitting an appreciable amount of very cool, white light. These devices come in a variety of colours including white, and can be cut to shape or curved. A standard 5 cm by 6 cm sheet manufactured by Seikosha emits 1.5 candelas (blue-green emits 2.2 candelas). This is sufficient for reading at night, or to light a pathway (albeit dimly), or to take in a room at a glance. Moreover, being just 0.7 mm thick, these sheets take up hardly any space at all. RS Electronics stock a number of ELS devices. Surprisingly, Toshiba ELS's are also (occasionally) seen on radio rallies where they are offered of rock-bottom prices, complete with a HV inverter board secured to the back side.

Electro-luminescent sheets typically require an operating voltage of 115 Vac, so a suitable inverter is needed to power them. The circuit diagram shows such an inverter, based on a CMOS 7555 timer IC, which is designed specifically to power the smaller 5 cm by 6 cm sheets. This draws about 120 mA, and will run for 5 hours off an alkaline PP3 battery — or 24 hours continuous off 6 alkaline AA batteries. A 22-nF capacitor provides current limiting for a dimmer setting when S1 is open, so that the Luminescent Torch may run for up to



36 hours continuous off 6 alkaline AA batteries — with about 30% reduction of light.

The 7555 IC is configured as a standard astable oscillator, and runs at about 600 Hz. A power MOSFET pulses 9 V through the series-connected 6-0-6 V primary windings of the transformer, stepping up the voltage to 115 Vac on load. The negative half-cycle is provided through back-EMF. Virtually any 'logic MOSFET' may be used in place of the BUZ22. No protection circuitry was found to be necessary. The transformer should be rated 100 mA per secondary winding, and the current limiting capacitor and switch S1 should be rated 250 Vac.

**Warning electrical shock hazard — this circuit supplies a voltage which is dangerous to touch. Never work on the circuit when it is switched on.**

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